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PSEUDOCRYPTHELIA, A NEW GENUS OF STYLASTERINE CORAL (COELENTERATA: HYDROZOA) FROM THE INDONESIAN REGION

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ABSTRACT

A new genus, *Pseudocrypthelia*, is described to receive *Cryptohelia pachypoma* Hickson and England, 1905, a species known only from deep water off Halmahera, Indonesia. It clearly does not belong to the genus *Calyptopora*, as previously suggested, and differs from *Crypthelia* by having rudimentary gastrostyles. The gastrostyles of *P. pachypoma* are morphologically unique among the Stylasterina and are hypothesized to represent an independent acquisition of the structure and thus are considered to be analogous, not homologous, to other stylasterine gastrostyles.

A table of characters is given for *Calyptopora*, *Pseudocrypthelia*, and *Crypthelia*.

INTRODUCTION

Originally described as a *Crypthelia* by Hickson and England (1905), *C. pachypoma* was later transferred to *Calyptopora* by Boschma (1968a). In a recent examination of the type-specimens of *C. pachypoma*, topotypic specimens of *Calyptopora reticulata* (Cairns, 1983a), and types of various other *Crypthelia* (Cairns, 1983b), it became apparent that *C. pachypoma* belongs to neither *Calyptopora* nor *Crypthelia*. It represents a discrete monotypic genus but has close affinities to *Crypthelia*.

SYSTEMATIC DESCRIPTION

Pseudocrypthelia new genus

Cryptohelia: Hickson and England, 1905: 22-23 (in part).

Crypthelia: Boschma, 1956: F100 (in part).

Calyptopora Boschma, 1968a: 107 (in part); 1968b: 315-320 (in part).

Diagnosis.—Colonies small, delicate, and primarily uniplanar. Coenosteal texture linear-imbricate. Nematopores round and slightly raised, occurring on pseudosepta, ampullae, coenosteal surface, and even within the gastropore. Cyclosystems unifacial, each covered by a massive fixed lid. Gastropore tube a double chamber. Small, rudimentary gastrostyle present; dactylostyles absent. Ampullae contained in lids of cyclosystem.

Discussion.—Hickson and England (1905) originally described *C. pachypoma* as a *Crypthelia* because of its obvious resemblance to other species of that genus; however, they failed to describe the distinct gastrostyles on their specimens. Boschma (1968a) reexamined the type-specimens, noticed the gastrostyles, and transferred it to his recently described genus *Calyptopora*. According to Boschma (1968b), in addition to sharing the possession of

Table 1. Comparison of characters of the three genera discussed in this paper.

Character	<i>Calyptopora</i>	<i>Pseudocrypthelia</i>	<i>Crypthelia</i>
Colony Shape	Large; massive base	Small, delicate; narrow base	Small, delicate; narrow base
Branches	Often anastomotic, carinate	Not anastomotic, not carinate	Not anastomotic, not carinate
Coenosteal Texture	Reticulate-Granular	Linear-Imbricate	Linear-Imbricate
Nematopores	Irregularly perforate mounds randomly distributed	Circularly perforate mounds concentrated around gastropore and ampullae as well as randomly	Circularly perforate, low mounds or flush pores usually concentrated around gastropore and lid
Cyclosystem orientation	Unifacial to sympodial	Exclusively unifacial	Exclusively unifacial
Cyclosystem Lid	Formed of enlarged pseudosepta; present or absent; often >1 per cyclosystem	A discrete, massive structure; always present; always 1 per cyclosystem	A discrete, massive structure; always present; rarely >1 per cyclosystem
Pseudosepta	Convex upper surface	Concave upper surface	Concave upper surface
Dactylotomes	Short	Short	Long
Gastropore Tube	Constricted, with a diffuse ring palisade	Double chamber; upper chamber linear-imbricate	Double chamber; upper chamber usually smooth
Gastrostyles	Lanceolate; ridged, with fused spines; medium H:W	Triangular mound; not ridged; individualized spines; low H:W (unique)	Not present
Dactylostyles	Present (Cairns, 1983a)	Absent	Absent
Ampullae	Scattered over coenosteum	Concentrated in lid	Concentrated in lid
Gastrozoid tentacles	Present	Unknown, presumed absent	Absent

gastrostyles, both *C. pachypoma* and *Calyptopora* were similar in having cyclostem lids and randomly arranged nematopore pits.

Table 1 lists the characters of the three genera—*Calyptopora*, *Pseudocrypthelia*, and *Crypthelia*—based on detailed examination using scanning electron microscopy. There are few characters in common between *Calyptopora* and *Pseudocrypthelia* but many between the latter and *Crypthelia*. The most significant character uniting *Calyptopora* and *Pseudocrypthelia*—their common possession of gastrostyles—is not considered to be an homologous similarity because of the great difference in the form of the styles. The style of *Pseudocrypthelia* is unique among the 16 genera of Stylasterina that have styles. It is triangular in shape with a very low H:W ratio and has very rudimentary spines. It is assumed to be of independent origin and therefore analogous, not homologous, to the style of *Calyptopora*. The other two characters that Boschma used to assign *C. pachypoma* to *Calyptopora*,

cyclosystem lids and nematopore pits, are shared by all three genera, and those lids and pits of *Pseudocrypthelia* and *Crypthelia* are structurally more similar. Furthermore, *Calyptopora* has distinct dactylostyles whereas *P. pachypoma* and *Crypthelia* have none.

Pseudocrypthelia is most similar to *Crypthelia*, differing primarily by the presence of gastrostyles. Traditionally, the presence or absence of gastrostyles has been used as one of the most conservative generic level characters in the Stylasterina and that differentiation is maintained here. Other characters differentiating the two genera are that *Pseudocrypthelia* has a linear-imbricate coenosteum inside the gastropore, relatively short dactylotomes, and nematopores scattered randomly over the coenosteum as well as regularly arranged on the pseudosepta. Characters unique to *Pseudocrypthelia* include its unusual gastrostyle, a combination of presence of gastrostyles and absence of dactylostyles, and typical coenosteal texture within the gastropore.

In a preliminary phylogenetic analysis of the stylasterine genera (Cairns, in press), those genera with cyclosystems, but lacking gastrostyles (*i.e.*, *Conopora*, *Cryptothelia*, and *Astya*), and *Pseudocryptothelia* are grouped as the most highly derived genera. They are strongly differentiated from the lesser derived genera (*i.e.*, those with cyclosystems and gastrostyles, including *Calyptopora*) by the loss of dactylostyles, loss of gastrozoid tentacles, round nematopores, loss of gastrostyle, linear-imbricate coenosteal texture, and a double-chambered gastropore. *Pseudocryptothelia* is hypothesized to be an offshoot from *Cryptothelia* in which a rudimentary gastrostyle has independently developed. This would explain why the style is so different from those of other stylasterines.

Occurrence. — Recent: Indonesia, 1089 m.

Type-Species. — *Cryptothelia pachypoma* Hickson and England, 1905.

***Pseudocryptothelia pachypoma* (Hickson and England, 1905)**

Plates 1-3

Cryptothelia pachypoma Hickson and England, 1905: 22-23, pl. 3, figs. 24-25.—England, 1926: 281.

Cryptothelia pachypoma: Boschma, 1953: 167; 1956: F100, fig. 82, 1b; 1957: 35-36.

Calyptopora pachypoma: Boschma, 1968a: 107; 1968b: 315-320, pl. 1, figs. 1-5, text-figs. 1-2.

Description.—Colonies up to 22 mm tall, 32 mm broad, and 2.5 mm in basal branch diameter. Coenosteal strips frequently bifurcate and reanastomose; their width is generally between 60-65 μ m. Platelets composing the strips are equally broad and occur with a frequency of about 70-75 per millimeter. Four or five concentric coenosteal strips occur within the upper chamber of the gastropore. These strips join *en chevron* beneath the cyclosystem lid and continue to carpet the lower surface of the lid. Nematopores, present as small apically perforated mounds, occur regularly, one on the upper outer edge of each pseudoseptum and along the edge of the lid; they occur irregularly on the ampullae, within the upper gastropore

chamber, and on the posterior branch surface. They are 30-35 μ m in diameter and usually raised 15-45 μ m above the coenosteal surface.

Cyclosystems slightly elliptical in cross section, the greater axis about 1.2 mm long. Thirteen to 19 dactylopores per cyclosystem, average = 16.1 (σ = 1.46), mode = 16 (Boschma, 1968b). Pseudosepta wedge-shaped and concave above. Dactylotomes extend only one-fourth to one-third the distance to the aperture separating the two gastropore chambers. Upper chamber about 0.62 mm in diameter (measured from the inner edges of opposing pseudosepta), narrowing to a round aperture of about one-third that diameter deeper in the pore. This aperture is the opening to the lower gastropore chamber. The lower chamber is flattened, about 0.40 mm in diameter, and envelops the lower part of the upper chamber. In the center of the lower chamber is a rudimentary gastrostyle, which projects slightly above the aperture between the two chambers. Gastrostyles are about 0.15 mm in height and basal diameter (H:W = 1) and composed of individualized, pointed spines, which are themselves covered by irregular, angular deposits of calcium carbonate.

One to three hemispherical male ampullae occur on each lid, each ampulla measuring about 0.75 mm in diameter. Terminal cyclosystems usually have no ampullae; they become better developed away from the branch tip. Efferent ducts were not observed. Female colonies were not available for study.

The tissue of *P. pachypoma* was not available for study.

Material examined.—The types.

Types.—Hickson and England (1905) based their original description of *C. pachypoma* on four syntypes; however, as Boschma (1968a: 107) correctly pointed out, one of these specimens is clearly different from the description and the other three specimens. He suggested that it was probably *C. platypoma*. Boschma (1968b) illustrated the other three syntypes. Because the types represent a mixed lot, I designate Hickson and England's figured specimen as lectotype (Boschma's 1968b: pl. 1, figs. 2, 4-5) and the

other three specimens as paralectotypes, only two of which are conspecific. All specimens are deposited at the Zoölogisch Museum, Amsterdam (Coel. 7394).

Distribution.—Boschma's (1957) record of *C. pachypoma* from the Galapagos is unfounded. These specimens from Albatross station 2818, tentatively identified by W. K. Fisher as *C. pachypoma*, were examined and found to be typical *Cryptothelia*, i.e., lacking gastrostyles. The only known locality for this species is therefore Siboga station 150: 0°06'N, 129°07.2'E (Jilolo Passage, east of Halmahera, Indonesia), 1089 m. Unfortunately, even this locality was queried by Hickson and England (1905) as a possible station error.

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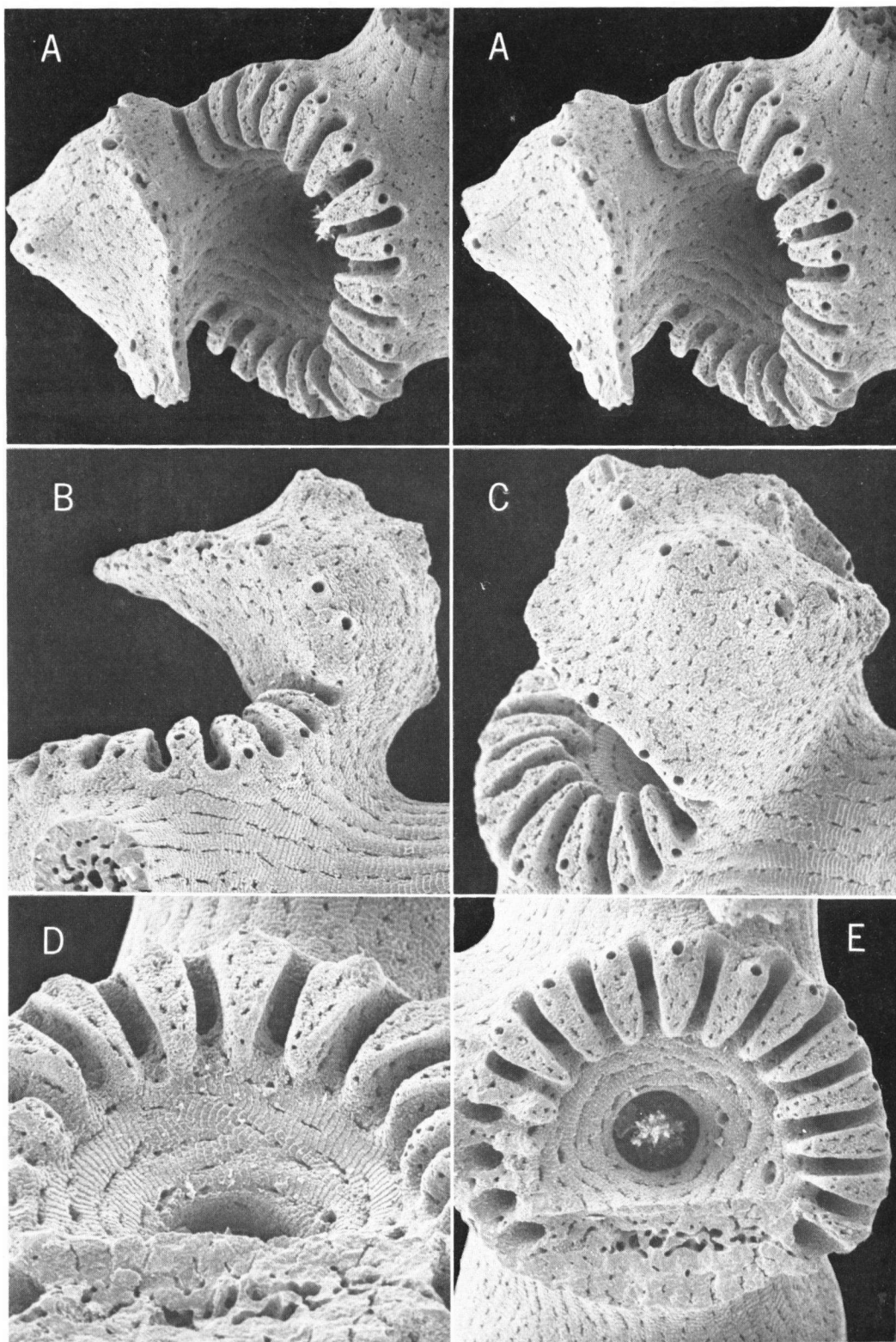


Plate 1. Paralectotype of *P. pachypoma*: A, cyclosystem with 18 dactylopores, $\times 50$, stereo pair; B-C, same cyclosystem from different angles showing ampullae and nematopores, $\times 63$; D-E, cyclosystems with lids removed revealing coenosteal texture and nematopores inside upper gastropore chamber, $\times 90$, $\times 60$, respectively.

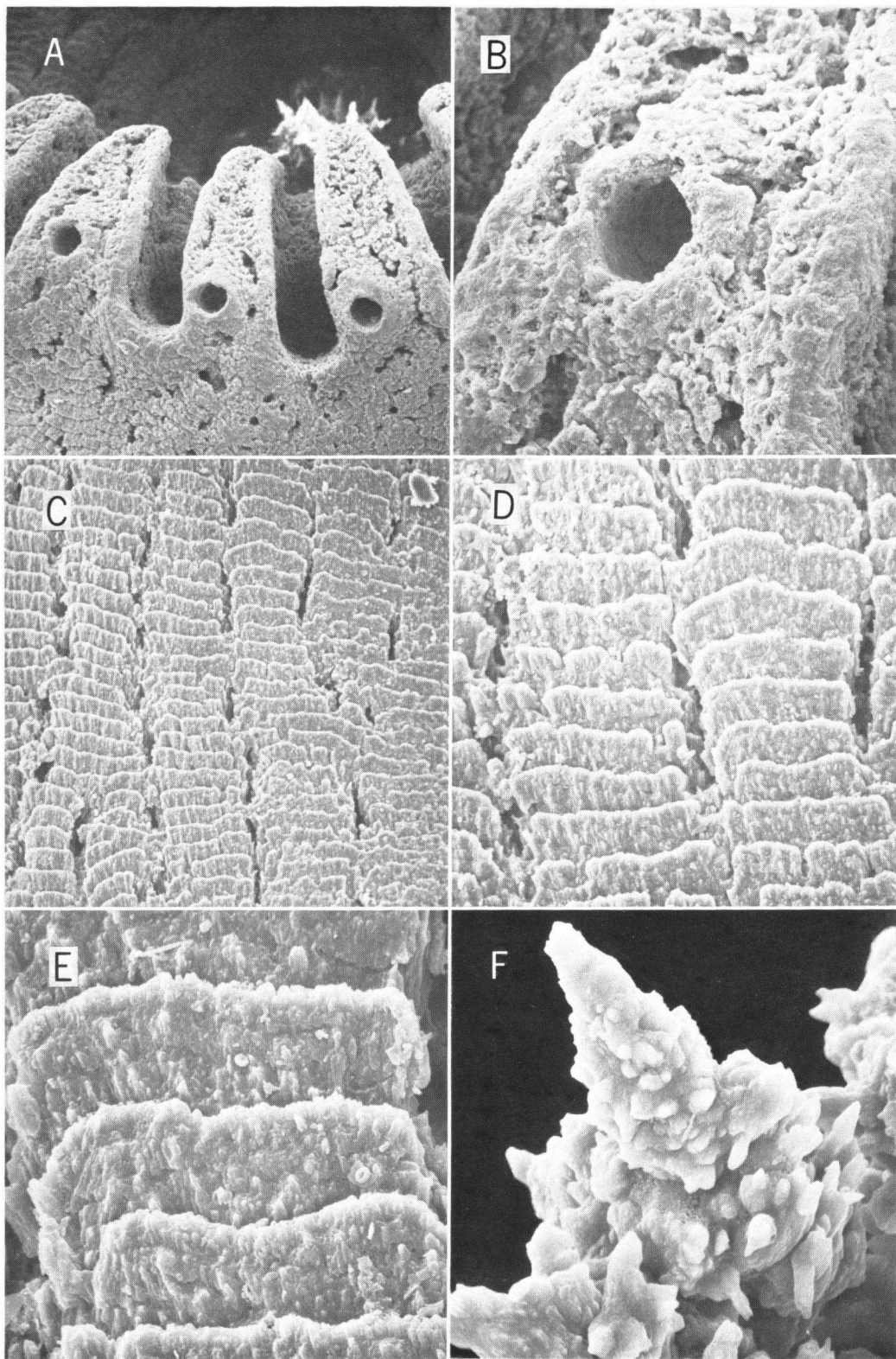


Plate 2. Paralectotype of *P. pachypoma*: A-B, enlargements of nematopores on edges of pseudosepta, $\times 160$, $\times 500$, respectively; C-E, progressive enlargements of linear-imbricate coenosteal texture, $\times 225$, $\times 475$, $\times 1350$, respectively; F, tip of gastrostyle illustrated in plate 3, $\times 1800$.

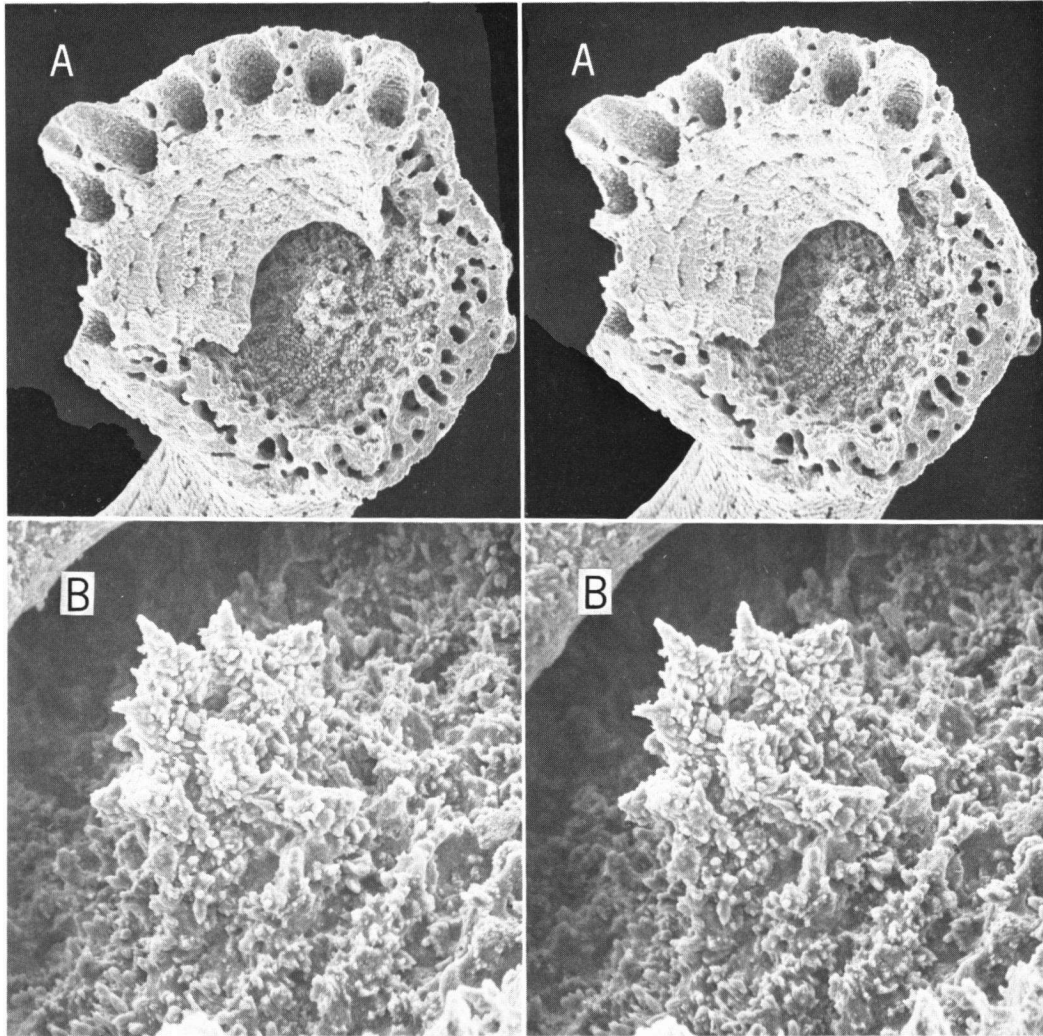


Plate 3. Paralectotype of *P. pachypoma*: A, longitudinal fracture of a cyclosystem revealing gastropore tube, internal coenosteal texture, and gastrostyle, $\times 82$, stereo pair; B, gastrostyle of previous figure, $\times 360$, stereo pair.